HEAD IMPACT ENERGY ABSORBING SUN VISOR PIVOT ROD CONNECTION INTERFACE COVER

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a divisional application of application serial number 10/237,367, filed on September 9, 2002, which application is now presently pending and is a divisional application of application serial number 09/766,770, filed on January 22, 2001, now Patent 6,494,521, which application is a continuation-in-part of application serial number 09/293,598, filed on April 16, 1999, now Patent 6,179,365, and a continuation-in-part of application serial number 09/669,072, filed September 22, 2000, which application is presently abandoned.

BACKGROUND OF THE INVENTION

1. Field of the invention:

The present invention relates to automotive sun visors which are rotatively and pivotally mounted above the windshield. More particularly, the present invention relates to pivot rods upon which sun visors are pivotally mounted, wherein the pivot rod has a connection interface (conventionally including an elbow) which is rotatively connected to the roof of the vehicle. Still more particularly, the present invention relates to a head impact energy absorbing pivot rod connection interface cover.

2. Description of the Prior Art:

Federal motor vehicle standards are being continuously updated. One area of current concern is occupant safety in the event of a crash. Occupants are typically violently moved in relation to the vehicle due to the inertial forces involved in a crash. Most vulnerable is the head of the occupants. Accordingly, FMVSS 201 has recently been upgraded to include a head injury criterion (HIC). In order for vehicle manufacturers to meet the HIC, additional padding of the interior trim must be provided.

One area of the interior of the passenger compartment of a motor vehicle that is particularly dangerous in the event of a head impact is the elbow of a sun visor pivot rod. The pivot rod elbow is quite rigid, of a small cross-section rod stock which is sometimes plastic covered, and the angle is a sharp ninety degrees. An occupant whose head untowardly strikes the pivot rod elbow is likely to be injured because the energy of the impact will be delivered to a small surface area of the skull.

Referring now to Figures 1 and 2, an example of a conventional sun visor 10 is shown. The sun visor 10 is pivotally mounted to the main portion 12b of a pivot rod 12. As best shown at Figure 2, the pivot rod 12 includes a connection interface that conventionally has ninety degree elbow 14, wherein an end portion 12a of the pivot rod 12 is rotatably mounted to the metallic roof 16 via a cap 18 which is fastened by screws 20. As an example of mounting, the end portion 12a of the pivot rod 12 is rotatably attached to a cap 18 in a spring loaded manner via a compression spring 22. The spring 22 provides frictional resistance as the elbow 14 is rotated with respect to the cap 18. There is a sun visor mounted, as described, at each of the left and right sides of the windshield 24 (only the driver-side sun visor being shown for simplification).

As can be seen at Figure 1, the pivot rod enables an occupant of the front seat to pivot the sun visor 10 to a storage location A adjacent the headliner 28 to a deployed location B so as to selectively occlude the windshield 24 along arrow P, which pivoting may well exceed ninety degrees. Further, the rotation afforded the elbow 14 allows the pivot rod 12 with its associated sun visor 10 to be rotated from a location adjacent the windshield 24 to an auxiliary location C adjacent the adjoining side door window 26 via a rotation along arrow R, a rotation which may exceed ninety degrees.

Accordingly, what is needed in the art is coverage of the pivot rod connection interface which will protect occupants from head impact injury in the event of a crash, yet allows the sun visor to both pivot and rotate in a fully normal and familiar manner.

SUMMARY OF THE INVENTION

The present invention is a pivot rod connection interface cover for covering the connection interface (ie., the elbow) of a sun visor pivot rod with respect to a vehicle roof so as to protect occupants from head impact injury in the event of a crash, and yet allow the sun visor to both pivot and rotate in a fully normal and familiar manner.

The pivot rod connection interface cover according to the present invention is composed of a base member and a cover member. The base member is affixed to the roof of the vehicle and preferably serves as a pivot rod support which allows rotation of the pivot rod with respect to the roof. The cover member snappingly engages the base member so as to be rotatable therewith and receives therewithin the pivot rod connection interface with the vehicle roof. The cover member has an exterior surface which provides head impact energy absorbance over an area much larger than that which would otherwise

be the case with respect to a conventionally exposed pivot rod elbow.

The base member is provided, in a preferred form, with a central aperture and a plurality of mounting holes (eg., two screw holes). The base member further has a perimeter and, in a preferred form, a plurality of resilient upstanding tabs situated at the perimeter. Each tab curvably follows the curvature of the adjoining perimeter, and is characterized by a lower chamfer, and upper chamfer and a apex therebetween, wherein the apex is disposed radially outward in relation to the perimeter.

The cover member has, in a preferred form, an internal annular slot for receiving therein the upper and lower chamfers of the tabs, wherein the apex slidably abuts the slot sidewall. In this regard, the resiliency of the tabs, coupled with the upper chamfer allow the cover member to snap lockingly onto the tabs and the tabs to be slidingly movable all along the annular slot.

The cover member may be a single component or may be a plurality of components. The cover member serves to cover the pivot rod connection interface, as for example by receiving a connection interface including a pivot rod elbow of an independent pivot rod or receiving a connection interface of an integrally incorporated visor pivot rod. For example, the cover member may be composed of an inner cover component which is rotatably connected with the base member, and of an outer cover component which is connected with the inner cover component, wherein a visor pivot rod is connected integrally with the inner cover component and the outer cover component covers the connection interface of the pivot rod.

The cover member, in one form thereof, has an exterior surface of a generally hemispherical dome shape, having a portal which may or may not be defined by a

flat-faced portal arch; and in another form thereof, has an exterior surface of a generally curvaceous shape with a flat-faced portal. Internally, the cover member has an interior hollow space defined by an interior surface. Preferably, but not necessarily, the interior surface is provided with left and right guide walls which are mutually parallel and straddlingly intersect the portal. Preferably, too, is provided a concave guide wall which extends between the left and right guide walls, and is located centrally relative to the annular slot. The left and right guide walls serve not only as an optionally included extra guidance for the pivot rod (pivot rod guidance is primarily by the portal and concave guide wall, if present), they serve as crush features which aid impact energy absorbance in cases where the impact causes deformation of the cover wall of the cover member.

Operation of a preferred form of the present invention for interfacing with a conventional pivot rod will now be discussed.

The base member is attached rotatably to the end portion of a pivot rod elbow at the central aperture, and the pivot rod is captured at the portal of the cover member. Screws then secure the base member to the roof of a vehicle. Next, the cover member is snapped onto the base member, wherein the end portion of the pivot rod elbow abuts the concave guide wall and is located centrally with respect to the annular sidewall of the cover member and the perimeter of the base member. The pivot rod side of the pivot rod elbow is guided between the left and right guide walls and exits at the portal.

An occupant can now pivot the sun visor on the pivot rod in the normal manner. Further, the occupant can rotate the sun visor to the adjoining side door window, in that while the base portion cannot move, the cover portion is rotatable with the pivot rod elbow as the sun visor is rotated in the normal manner.

In the unfortunate event of a crash, should the occupant be thrown forwardly in a collision course toward the pivot rod connection interface (ie., the elbow), the cover member will absorb the energy of the head impact over a sufficiently large area to limit the likelihood of head impact injury. In the event of the head impact that is so great as to deform or crush the cover member, the left and right guide walls will serve as crush features that absorb impact energy.

Accordingly, it is an object of the present invention to provide a head impact energy absorbing connection interface cover for a pivot rod of a sun visor.

It is a further object of the present invention to provide a head impact energy absorbing connection interface cover for a pivot rod elbow of a sun visor, wherein the sun visor is both pivotable and rotatable.

It is yet another object of the present invention to provide a pivot rod connection interface cover in which the pivot rod is integrated therewith.

These, and additional objects, advantages, features and benefits of the present invention will become apparent from the following specification.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a portion of an automotive interior, showing a prior art sun visor pivot rod connection interface including an elbow.

Figure 2 is a partly sectional, detail side view of the prior art sun visor pivot rod connection interface.

Figure 3 is a perspective view of a portion of an automotive interior, showing a sun visor pivot rod connection interface cover according to a first form of the present invention.

Figure 4 is a perspective view of the pivot rod connection interface cover according to the first form of the present invention.

Figure 5 is a bottom plan view of a cover member of the pivot rod connection interface cover according to the first form of the present invention.

Figure 6 is a top plan view of a base member of the pivot rod connection interface cover according to the first form of the present invention.

Figure 7a is a partly sectional view of the cover member, seen along line 7a-7a in Figure 5.

Figure 7b is a partly sectional side view of the base member, seen along line 7b-7b in Figure 6.

Figure 8 is a partly sectional, detail side view of the pivot rod connection interface cover according to the first form of the present invention, shown in operation mounting a sun visor pivot rod to the roof of an automobile.

Figure 9 is a detail, partly sectional view of a snapping interface between the base member and the cover member, as seen at circle 9 of Figure 8.

Figure 10a is a partly sectional top view of the pivot rod connection interface cover according to the first form of the present invention, shown in operation with a pivot rod, wherein a portion of the cover member is cut-away, and wherein the pivot rod is at a first location.

Figure 10b is a partly sectional top view of the pivot rod connection interface cover shown in operation with a pivot rod, wherein a portion of the cover member is cut-away, and wherein the pivot rod is now rotated to a second location.

Figure 11 is a perspective view of a portion of an automotive interior, showing the

sun visor pivot rod connection interface cover according to a second form of the present invention, wherein the sun visor is at its storage location.

Figure 12 is a perspective view of a portion of an automotive interior as in Figure 11, now showing the sun visor pivoted to its deployed location adjacent the windshield.

Figure 13 is a perspective view of a portion of an automotive interior as in Figure 11, now showing the sun visor pivoted to its auxiliary location adjacent the adjoining side door window.

Figures 14a and 14b are perspective views of the pivot rod connection interface cover according to the second form of the present invention.

Figure 15 is a bottom plan view of a cover member of the pivot rod connection interface cover according to the second form of the present invention.

Figure 16 is a bottom plan view of a cover member of the pivot rod connection interface cover according to an alternative aspect of the present invention.

Figure 17 is a partly sectional, detail side view of the pivot rod connection interface cover according to the alternative aspect of the present invention, shown in operation mounting a sun visor pivot rod to the roof of an automobile.

Figure 18 is another bottom plan view of a cover member of the pivot rod connection interface cover according to the alternative aspect of the present invention.

Figure 19 is an exploded perspective view of a pivot rod connection interface cover according to a third form of the present invention.

Figure 20 is a top plan view of the pivot rod connection interface cover according to the third form of the present invention.

Figure 21 is a sectional side view of the pivot rod connection interface cover

according to the third form of the present invention.

Figure 21A is a broken-away detail sectional view of component interaction between the base member and the cover member of the pivot rod connection interface cover according to the third form of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to Figures 3 through 18, the pivot rod connection interface cover according to the present invention will be described, wherein Figures 3 through 10b depict a first form of the pivot rod connection interface cover 100, Figures 11 through 15 depict a second form of the pivot rod connection interface cover 100', Figures 16 through 18 show an alternative aspect of the pivot rod connection interface cover, and Figures 19 through 21A depict a third form of the pivot rod connection interface cover 100'''.

As can be understood by simultaneous reference to Figures 3 and 4, the pivot rod connection interface cover 100 includes a cover member 102 having, preferably, a generally hemispherical dome shape. The pivot rod connection interface cover 100 receives the conventional elbow 14 of a conventional pivot rod 12 of a conventional sun visor 10. In this regard, the sun visor 10 is conventionally pivotally mounted on the main portion 12b of the pivot rod 12, so as to be conventionally pivotal from adjacent the headliner 28 (at location A) to adjacent the windshield 24 (at location B, shown in phantom) along arrow P. Further in this regard, the pivot rod connection interface cover 100 is structured to enable rotation of the elbow 14 so that the pivot rod 12 and its associated sun visor 10 are conventionally rotatable from adjacent the windshield 24 to adjacent the adjoining side door window 26 (at auxiliary location C, shown in phantom) along arrow R.

As can be understood from Figure 4, the large diameter of the cover member 102, on the order for example of about 2 and one-half inches, affords a radius of curvature of the exterior surface 132a thereof which is much larger than that of a naked pivot rod elbow 14. Accordingly, in the event of a crash, an occupant whose head H is propelled forcibly in a direction F against the pivot rod connection interface cover 100, would be far less likely to be injured because of the large contact area of the exterior surface 132a, as compared to a naked pivot rod elbow 14, which has a small contact area because of its much smaller radius of curvature, as well as the compounded danger associated with its rather sharply defined ninety degree bend.

Referring now additionally to Figures 5 through 10b, the structure and function of the pivot rod connection interface cover 100 will be further detailed, wherein it will be noted that the pivot rod connection interface cover further includes a base member 104.

The base member 104 has a central aperture 106 and a pair of mounting holes 108. The base member 104 has a circular perimeter 110. A plurality of resilient upstanding tabs 112 are located at the perimeter 110, three tabs being shown by way of preference. Each tab 112 curvably follows the circular curvature of the adjoining perimeter 110. Each tab 112 has a lower chamfer 114, an upper chamfer 116 and an apex 118 situated therebetween, wherein the apex is disposed radially outward in relation to the perimeter 110. The interface of each tab 112 with the base member provides a resiliency such that each tab may be moved radially inwardly when exposed to a firmly applied force, and will thereafter return to its original shape. A preferred material of composition of the base member is plastic, but a metal or another structurally strong material may be substituted.

The cover member 102 is preferably composed of plastic, which may be decorated

to match the color and look of the passenger compartment interior decor, and although the aforesaid hemispherical dome shape is preferred, this may be modified by bevels or other pleasingly fanciful shapes provided no sharp corners are created which would raise head impact injury concerns.

Adjacent the equatorial terminus 120 of the cover member 102, an internal annular slot 122 is formed for receiving therein the upper and lower chamfers 116, 114 of the tabs 112, wherein the apex 118 slidably abuts the slot sidewall 124. In this regard, when the base member 104 is aligned with the equitorial terminus 120 and then pushed into the cover member 102, the resiliency of the tabs 112, coupled with the upper chamfer 116 provide snap lockingly of the tabs into the annular slot 122, wherein the base member is rotatable with respect to the cover member as the tabs slide along the annular slot. The resiliency of the tabs 112, coupled with the lower chamfer 114 provide snap unlockingly of the tabs out of the annular slot 122, which allows for easy disassembly.

The nature of a preferred interface of the tabs 112 in the annular slot 122 is shown at Figure 9. It will be noted that the annular slot 122 is recessed from the equitorial terminus 120 so that the base member 104 is flush with the equitorial terminus when the tabs 112 are received into the annular slot 122. A preferred form of the annular slot 112 includes a stair-step 126 which abuts the upper chamfer 116. As was earlier noted, the apex 118 abuts the slot sidewall 124. Further the lower chamfer 114 abuts the slot corner 128. Additionally, it will be noted that there is a small spacing (to facilitate relative rotation without binding) between the perimeter 110 of the base member 104 and the inner periphery 130 of the cover member 102 at the equitorial terminus 120.

The interior surface 132b of the cover wall 132 of the cover member 102 is a

concave reciprocal of the convex hemispherical dome shape of the exterior surface 132a. A portal 134 is formed through the cover wall 132. The portal 134 may be defined by a flat-faced portal arch 136, as shown, or by another configuration, such as for a preferably example, a shape which more smoothly merges to the convexity of the hemispherical dome shape. The portal 134 may be circular or, as shown, may be elongated to universally accommodate variously elongated pivot rod end portions 12a.

Internally to the cover member 102, mutually parallel left and right guide walls 138, 140 are connected at both ends thereof to opposing locations of the interior surface 132b, wherein the center of the inner periphery 130 is located equidistantly therebetween and the left and right guide walls are aligned directly with the portal in straddling relation thereto. A concave guide wall 142 extends between the left and right guide walls 138, 140, and the curvature thereof is located concentrically relative to the inner periphery 130. The left and right guide walls 138, 140 serve not only as an optionally included extra guidance for the pivot rod (pivot rod guidance occurs between the concave guide wall 142 and the portal 134), they serve as crush features which aid impact energy absorbance in cases where the impact causes deformation of the cover wall 132 of the cover member 102.

Operation will now be described with particular attention being directed to Figure 8.

The base member 104 is attached rotatably to the end portion of a pivot rod elbow 14 at the central aperture 106. By way of exemplification, the end portion 12a of the pivot rod 12 has a slot and trapped washer 146 at one side of the central aperture, and a spring loaded washer 148 at the other side of the central aperture, wherein spring pressure generates a desired degree of resistance to rotation of the pivot rod elbow in relation to the base member. Other structural interfaces of the base member 104 with respect to the roof

and the pivot rod may be utilized, depending on the application involved. Indeed, the pivot rod may be rotatably attached to the roof via an appropriately configured bracket, and the base member may be connected to the bracket. The pivot rod 12 is captured at the portal 134 of the cover member 102.

Screws 144 then secure the base member to the roof 16 of a vehicle, squeezing any intervening headliner 28. Next, the cover member is snapped onto the base member, wherein the tabs 112 resiliently snap into the annular slot 122, as described hereinabove. Now, the end portion 12a of the pivot rod 12 abuts the concave guide wall and is axially positioned centrally with respect to the inner periphery of the cover member and the perimeter of the base member. The main portion 12b of the pivot rod is guided between the left and right guide walls and exits the cover member through the portal.

As shown at Figures 10a and 10b, the cover member 102 may now rotate with the pivot rod 12, yet the base member 104 remains stationary.

As shown at Figure 3, an occupant can now pivot the sun visor on the pivot rod in the normal manner. Further, the occupant can rotate the sun visor to the adjoining side door window, in that while the base portion cannot move, the cover portion is rotatable with the pivot rod elbow as the sun visor is rotated in the normal manner.

As mentioned, in the unfortunate event of a crash, should the occupant be thrown forwardly in a collision course toward the pivot rod elbow, the exterior surface 132a of the cover member will distribute the energy of the head impact over a sufficiently large area to limit the likelihood of head impact injury; and, in the event of the head impact being is so great as to deform or crush the cover member, the left and right guide walls will serve as crush features that absorb impact energy.

Referring now to Figures 11 through 15, the pivot rod connection interface cover 100' according to the present invention will be described, wherein like numerals to those previously used for Figures 1 through 10b will indicate like structural designations in Figures 11 through 15.

The pivot rod connection interface cover 100' includes the base member 104 as was described hereinabove, and shown at Figures 6 and 7b. As can best be seen by Figures 14a and 14b, the pivot rod connection interface cover 100' further includes a cover member 102' having a generally curvaceous shape. The preferred generally curvaceous shape includes a rounded nose portion 150 and a flat-faced portion 152 at the portal 134'. The portal 134' is open at the equitorial terminus 120', thereby allowing the cover member 102' to be detached fully from the pivot rod 12 when snapped off from the base member 104. The generally curvaceous shape of the cover member 102' as shown at Figures 11 through 15 is believed to be the most preferred cover member shape.

Referring now to Figures 11 through 13, it is to be understood that the pivot rod connection interface cover 100' receives the conventional elbow 14 of the conventional pivot rod 12 of the conventional sun visor 10. In this regard, the sun visor 10 is conventionally pivotally mounted on the main portion 12b of the pivot rod 12, so as to be conventionally pivotal from adjacent the headliner 28, at storage location A to adjacent the windshield 24, at deployed location B. Further in this regard, the pivot rod connection interface cover 100 is structured to enable rotation of the elbow 14 so that the pivot rod 12 and its associated sun visor 10 are conventionally rotatable from adjacent the windshield 24 to adjacent the adjoining side door window 26, at auxiliary location C. By reference to Figures 11 through 13, it will be noted that the sun visor 10 may be configured to

recessively fit with respect to the pivot rod connection interface cover 100' in a most aesthetically pleasing manner.

The cover member 102' is preferably composed of plastic, which may be decorated to match the color and look of the passenger compartment interior decor, and has a generally curvaceous shape without sharp corners which would raise head impact injury concerns.

Adjacent the equatorial terminus 120' of the cover member 102', at the inner periphery 130' is the aforementioned annular slot 122'. The annular slot 122' is, as described above, formed for receiving therein the upper and lower chamfers 116, 114 of the tabs 112, wherein the apex 118 slidably abuts the slot sidewall. In this regard, when the base member 104 is aligned with the equitorial terminus 120' and then pushed into the cover member 102', the resiliency of the tabs 112, coupled with the upper chamfer 116 provide snap lockingly of the tabs into the annular slot 122', wherein the base member is rotatable with respect to the cover member as the tabs slide along the annular slot. The resiliency of the tabs 112, coupled with the lower chamfer 114 provide snap unlockingly of the tabs out of the annular slot 122', which allows for easy disassembly.

The nature of a preferred interface of the tabs 112 in the annular slot 122 was described hereinabove and is as generally shown at Figure 9.

The interior surface 132b' of the cover wall 132' of the cover member 102' is of a generally concave shape. The portal 134' is formed through the cover wall 132' at the flat faced portion 152. The portal 134' is preferably elongated in a direction normal to the plane defined by the equitorial terminus 120' and is preferably open thereat.

Internally to the cover member 102', mutually parallel left and right guide walls 138',

140' are connected at both ends thereof to opposing locations of the interior surface 132b', wherein the center of the inner periphery 130' is located equidistantly therebetween and the left and right guide walls are aligned directly with the portal 134' in straddling relation thereto. A concave guide wall 142' extends between the left and right guide walls 138', 140', and the curvature thereof is located concentrically relative to the inner periphery 130'. The left and right guide walls 138', 140' serve not only as an optionally included extra guidance for the pivot rod (pivot rod guidance is primarily between the concave guide wall 142' and the portal 134'), they serve as crush features which aid impact energy absorbance in cases where the impact causes deformation of the cover wall 132' of the cover member 102'.

Operation will now be described for the pivot rod connection interface cover 100'.

The base member 104 is attached rotatably to the end portion of a pivot rod elbow 14 at the central aperture 106 (as was described with respect to the pivot rod connection interface cover 100). Next, the pivot rod 12 is passed into the portal 134' between the left and right guide walls 138', 140', against the concave guide wall 142' and then snapped onto the base member, wherein the tabs 112 resiliently snap into the annular slot 122, as described hereinabove. Now, the end portion of the pivot rod 12 abuts the concave guide wall and is axially positioned centrally with respect to the inner periphery of the cover member and the perimeter of the base member. The main portion of the pivot rod is guided between the left and right guide walls and exits the cover member through the portal. The cover member 102' is now able to rotate with the pivot rod 12, while the base member remains positionally affixed with respect to the roof. Accordingly, an occupant can now pivot the sun visor on the pivot rod in the normal manner. Further, the occupant can

rotate the sun visor to the adjoining side door window, in that while the base portion cannot move, the cover portion is rotatable with the pivot rod elbow as the sun visor is rotated in the normal manner.

As mentioned, in the unfortunate event of a crash, should the occupant be thrown forwardly in a collision course toward the pivot rod elbow, the exterior surface 132a' of the cover member 102' will distribute the energy of the head impact over a sufficiently large area to limit the likelihood of head impact injury; and, in the event of the head impact being is so great as to deform or crush the cover member, the left and right guide walls will serve as crush features that absorb impact energy.

Referring now to Figures 16 through 18, an alternative aspect of the present invention is shown, wherein absent are the left and right guide walls and the concave guide wall. Figure 16 is like Figure 5, with like parts having like numbers, except the cover 102' now has no left and right guide walls and no concave guide wall. Figure 17 depicts a pivot rod connection interface cover 100" according to the alternative aspect of the present invention, shown in operation, as in Figure 8, with like parts having like numbers. This alternative aspect of the present invention is applicable equally to any shaped dome, including the curvaceous shaped dome, as shown at Figure 18, which is like Figure 15 having a cover 102"' and wherein like parts have like numbering.

Referring now to Figures 19 through 21A, the third form of pivot rod connection interface cover 100"' will be detailed.

The pivot rod connection interface cover 100"' is preferably composed of a plastic material, and includes a base member 302 and a cover member 304, wherein the cover member is composed of an inner cover component 306 and an outer cover component

308. A visor pivot rod 310 is integrally connected to the inner cover component 306.

The inner cover component 306 includes a generally cup shaped annulus 312, including a floor 314, a sidewall 316, an annular outer cover boss 318a and an annular inner cover boss 318b which are both slightly elevated relative to the floor, and a peripheral upper-shelf 320. The visor pivot rod 310 is connected, via a connection interface 354, with the sidewall 316 and projects from the annulus 312 in a direction parallel to the floor 314. A pair of braces 322a, 322b, which extend from the sidewall at the visor pivot rod to the floor, are preferably provided as part of the connection interface 354 for stiffening the visor pivot rod 310 relative to the annulus 312, as well as for providing crush features for absorbing impact energy. The visor pivot rod 310 may advantageously have an axially extending interior recess 324 for receivably accepting therealong wiring for visor related electronics, such as for example a lighted vanity mirror. A cover stud 326 projects perpendicularly from the floor and has an engagement barb 328 for being secured to the base member 302. The cover stud 326 is preferably hollow to save material and provide a passage for visor wiring.

The outer cover component 308 has a cover wall 308' having an external surface 308" shaped as generally discussed and shown hereinabove, such as for example the hemispherical dome shape or the generally curvaceous shape, including a portal 330 formed in the wall cover through which the visor pivot rod 310 projects, the cover wall defining an interior hollow 308"'. The outer cover component 308 snaps onto the inner cover component 306, for example by a tab 332 of the outer cover component snapping into a slot 334 of the inner cover component and oppositionally, a pair of groves 336 of the portal 330 interferingly engaging a conforming section 338 of the visor pivot rod 310, and/or

by a plurality of tabs snapping into respective slots.

The base member 302 has an annular outer base boss 340 and an annular inner base boss 342 which are both elevated slightly above a base plate 344, the base plate having attachment holes 346. A base post 348 has a tapering bore 350, depends from the base plate 344, and has axial relief slots 352.

In assembly, the base member 302 is screwably attached to the vehicle roof. A connection 325 is provided, as shown at Figure 21A, wherein the cover stud 326 is thrust into the tapering bore 350 of the base post 348 until the engagement barb 328 has passed through the base post 348 (after causing the relief slots 352 to have temporarily widened), and is now in interfering abutment with the base post, as shown at Figure 21. The outer cover component 308 is then snapped onto the inner cover component 306. Alternatively, the base member 302 and the inner cover component 306 may be pre-assembled so as to be either permanently or not permanently conjoined utilizing any interconnection modality which allows for mutual rotation therebetween. A sun visor 356 may be pivotally attached to the visor pivot rod 310 prior to commencement of the foregoing assembly process.

Upon completion of assembly, an occupant of the vehicle is protected from head impact injury relative to the connection interface 354 by the outer cover component 308 via its impact distributing shape and/or crush characteristics. Further, the cover member 304 is rotatable relative to the base member 302 in guidance by the outer and inner cover bosses 318a, 318b sliding on, respectively, the outer and inner base bosses 340, 342 in cooperation with the cover stud 326 relatively rotating contactably with the base post 348.

To those skilled in the art to which this invention appertains, the above described

preferred embodiment may be subject to change or modification. Such change or modification can be carried out without departing from the scope of the invention, which is intended to be limited only by the scope of the appended claims.